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pioneers would be most valuable to science. Although Professor Chittenden attempts to reconcile his views in regard to antipeptone with modern investigations, in an addendum to 'a chemico-physiological study of certain derivatives of the proteids,' page 321, still we think he fails to make his point very clear.

JOHN A. MANDEL.

Primitive Man. By DOCTOR MORIZ HOERNES. Translated into English by JAMES H. LOEWE, London, 1900. Dent and Co. Pp. 136, Figs. 48.

This handy little 16mo volume forms the twenty-third number in the series of Temple Primers designed by the publishers to furnish, for a shilling a copy, the best and latest results of scholarship to the average reader who cannot afford the costly encyclopedias. Beginning with the subject of man's place in nature the author sums up the characteristics of culture, the earliest traces of man, the ages of stone, bronze and iron; and the primitive history of the Aryans and Semites. Small space is given to the Western Hemisphere, but that is fortunate in two ways, for some wild guessing has been done on that topic, and, secondly, American readers will be glad to have a handy little guide book to European archeology. Not one American authority is mentioned in the bibliography and no European work later than 1894.

O. T. MASON.

Anleitung zur mikroskopischen Untersuchung der vegetabilischen Nahrungs- und Genussmittel. By DR. A. F. W. SCHIMPER, ö. Professor der Botanik an der Universität Basel. Second revised edition. Jena, Verlag von Gustav Fisher. 1900.

A melancholy interest attaches to the consideration of this book owing to the recent death of Dr. Schimper in the prime of life. Here in a space of 150 pages we have a very attractive and useful introduction to the microscopic appearance of flours, starches and their adulterants; of coffee and its adulterants; cocoa, chocolate, tea, tobacco, pepper, cloves, allspice, red pepper, mustard, saffron, cinnamon, vanilla, cardamon, nutmeg, mace, ginger and turmeric. There is also a chapter on the

adulterants of fruit jellies, and one on honey. The book contains a good index and 134 figures, which are well drawn and very attractive. Among the substances used for adulterating coffee Schimper mentions the following: Chickory, beets, carrots, figs, various cereals, lupin seeds, acorns, carobs, dates, vegetable ivory, potatoes. These are described in a space of twenty pages with seventeen illustrations. Under fruit jellies, we learn that agar-agar is frequently employed for their adulteration and that this substance may be detected readily by means of the microscope, owing to the fact that these seaweeds always have numerous diatoms clinging to their surface, as any one may determine readily by burning a small quantity of agar-agar in a platinum dish, adding to the ashes a few drops of water rendered acid by HCl and then examining under high powers of the microscope. When jellies are suspected of adulteration with agar-agar, the author recommends that the mass of jelly be boiled with about five per cent. dilute sulphuric acid, and then that a few crystals of permanganate of potash be carefully added. The previously suspended diatom shells now fall to the bottom and form a more or less rich sediment, which may be examined without any further preparation.

In this age of haste to be rich at any cost, the extension of the adulteration of food products has become very great, and the knowledge contained in books of this kind increases yearly in importance, not only to the special worker, but to the general public. The moderate price of four Marks in paper covers, or five Marks, bound, puts the book within the reach of every one.

ERWIN F. SMITH.

Use-Inheritance illustrated by the Direction of Hair on the Bodies of Animals. By WALTER KIDD, M.D., F.Z.S. London, Adam and Charles Black. 1901.

This is an interesting contribution to the dynamic or Lamarckian principles of evolution. Dr. Kidd has first treated of the formation of whorls in the hairy coats of mammals; and second, the slope of hair in certain selected regions of the bodies of animals and

man. In the domestic horse there are five regions where whorls occur—i. e., the frontal, inguinal, pectoral, post-humeral or axillary, and cervical. These are due, the author shows, to the traction of the underlying muscles. It is interesting to observe that they are absent in the zebra, and are apparently the result of the movements and work done by the horse in a state of domestication. 'It is difficult,' the author concludes, 'to see any explanation of the formation of whorls, featherings and crests in the hairy coats of mammals other than a dynamical one.' His reasons for the dynamical view are as follows:

1. They all occur, except that on the vertex, in regions where opposing traction of underlying muscles is found.

2. They never occur over the middle of a large muscle, and seldom in any place where there is not a hollow or groove in the superficial anatomy.

3. They are most uniform and most marked in animals with very strong muscles, and those that are actively locomotive.

4. Their constancy appears to depend upon range of action and activity of function of the muscles in the part and individual animal affected. This is especially shown in the three regions of the domestic horse—pectoral, post-humeral and inguinal.

As regards the hair slope, the author arrives at the following conclusions:

1. To understand the disposition of hair on living animals, it is necessary to look upon it as a stream, and this is very plastic.

2. In man, and various groups of animals, the great majority of the peculiarities here noted are congenital.

3. Certain peculiarities of hair-slope are at present in process of development.

4. The hair streams are disposed in the lines of least resistance.

5. The mechanical conditions required for the production of both the general and the special hair-slopes are in present operation.

6. The hair-slope can be modified during the life of an individual.

7. Selection (whether natural, sexual or germinal) is incompetent to produce these peculiarities of hair-slope.

8. If these are not originally created with the forms of life which present them, they must have been produced in ancestors by use or habit.

The author seems to have made out a good case and to have been led by the legitimate use of the inductive method to what seem to be valid and natural conclusions.

A. S. P.

Some Fossil Corals from the Elevated Reefs of Curaçao, Arube and Bonaire. By T. WAYLAND VAUGHAN. *Sammlungen des Geologischen Reichs-Museums in Leyden*, Ser. 11, Bd. 11, Heft. 1901.

Mr. Vaughan makes his report upon the fossil corals from the Dutch West Indies, collected by Professor K. Martin, director of the Leyden Geological Museum, part of an elaborate study of the history and synonymy of the West Indian corals. The paper is companion to another by the same writer, shortly to appear, upon the stony corals of Porto Rico collected by the recent survey of the U. S. Fish Commission. The latter will contain photographic reproductions of most of the living species of West Indian corals. Both papers are subsidiary to a larger work upon the post-Eocene Corals of the United States, now in the course of preparation.

The author is preeminently qualified for the task he has undertaken. In addition to having access to the large accumulations of corals at the U. S. National Museum and Geological Survey, including the type specimens of Dana, he has visited the collections in London, Paris, Berlin, Turin and other centers, where are contained the types of Milne-Edwards and Haime, Ehrenberg, Klunzinger, Duncan, Duchassaing and Michelotti, and other workers on the corals. In some way the present revision is a continuation of the work of Professor J. W. Gregory on the fossil corals of Barbados.

The result is what might have been expected. With the further accumulation of material for study, enabling the possible variations within the limits of a species to be estimated, and the comparison of the type specimens of different investigators, either side by side, or by the aid of photographs, it